A B S T R A C T

A magnetron (2), a launcher (4) which extracts the output power of the magnetron (2), an impedance generator (5) having one terminal connected to the output terminal of the launcher (4), and a reference signal supplier (6) connected to the other terminal of the impedance generator (5) are included. The reference signal supplier (6) supplies, to the magnetron (2), a reference signal lower in electric power and stabler in frequency than the output from the magnetron (2). The oscillation frequency of the magnetron (2) is locked to the frequency of the reference signal by injection of the reference signal. The impedance generator (5) can reduce the change width of the oscillation frequency of the magnetron (2) by adjusting the load impedance of the magnetron (2). This implements a magnetron oscillator (1) which has high frequency stability and does not fluctuate the frequency even when the output power is changed.